

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~striketrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1, 8, 10, 11, 16-18, 28 and 29 in accordance with the following:

1. (Currently Amended) A wireless sensor system comprising:
a plurality of sensors to detect respective parameters to be detected;
a sensor signal transmitter to transmit wireless sensor signals outputted respectively from the sensors;
an plurality of electric power receivers to receive wirelessly an electric operating power required to drive the sensors and the sensor signal transmitter;
a sensor signal receiver to receive the sensor signals transmitted from the sensor signal transmitter; and
an electric power transmitter to transmit the electric operating power wirelessly to the electric power receiver,
wherein only one sensor signal receiver is provided for commonly receiving the sensor signals from the plural sensors, and
only one electric power transmitter is provided for commonly transmitting the electric operating power wirelessly to the plural electric power receivers.

2. (Previously Presented) The wireless sensor system as claimed in claim 1, wherein the sensor signal receiver has a capability of receiving the sensor signals from the respective sensors, which are transmitted by the sensor signal transmitter, and the electric power transmitter is disposed in a sensor signal receiving unit including the sensor signal receiver.

3. (Previously Presented) The wireless sensor system as claimed in claim 1, further comprising a plurality of wireless sensor units each including the sensors, the sensor signal transmitter and the electric power receiver.

4. (Previously Presented) The wireless sensor system as claimed in claim 1, further

comprising a single wireless sensor unit including the sensor, the sensor signal transmitter and the electric power receiver,

wherein the plural sensors are provided in this single wireless sensor unit, and
the sensor signal transmitter is operable to transmit wireless the sensor signals outputted from the plural sensors.

5. (Previously Presented) The wireless sensor system as claimed in claim 3, wherein some or all of the plural wireless sensor units each include the plural sensors, and
the respective sensor signal transmitters in such some or all of the wireless sensor units are operable to transmit wirelessly the sensor signals outputted from the sensors.

6. (Previously Presented) The wireless sensor system as claimed in claim 3, wherein the plural wireless sensor units are mounted on different bearings in a machine plant.

7. (Original) The wireless sensor system as claimed in claim 3, wherein at least one of the plural wireless sensor units includes the sensor utilized as a tire pressure sensor for an automotive vehicle or a rotation sensor for a wheel support bearing assembly.

8. (Currently Amended) A wireless sensor system comprising:
a plurality of wireless sensor units corresponding to respective different types of parameters to be detected and arranged in the proximity of a bearing assembly, each of the wireless sensor units including an electric power receiver having a tuning circuit and a detecting and rectifying circuit to secure an electric operating power from an electromagnetic wave of a predetermined power feeding frequency, a sensor to detect a parameter to be detected, and a sensor signal transmitter to transmit a signal outputted from the sensor as a wireless sensor signal in the form of an electromagnetic wave of a natural frequency different from the power feeding frequency; and

a sensor signal receiving unit to supply wirelessly the electric operating power to each of those wireless sensor units and to receive a sensor signal transmitted from each of those wireless sensor units, the sensor signal receiving unit including an electric power transmitter to transmit wirelessly the electromagnetic wave of the predetermined power feeding frequency and only one sensor signal receiver to receive the wireless sensor signal of the natural frequency that is transmitted wirelessly from each of the wireless sensor units,

wherein only one sensor signal ~~receiver~~ receiving unit is provided for commonly receiving

the sensor signals from the plural sensors and for commonly transmitting the electromagnetic wave to the plural electric power receivers.

9. (Previously Presented) The wireless sensor system as claimed in claim 8, wherein the sensor signal receiver of the sensor signal receiving unit includes a plurality of receiving circuits each operable to receive a signal of a single frequency corresponding to the assigned natural frequency of the wireless sensor signal transmitted from each of the wireless sensor units.

10. (Currently Amended) The wireless sensor system as claimed in claim 8A
~~wireless sensor system comprising:~~

~~a plurality of wireless sensor units, each of the wireless sensor units including an electric power receiver having a tuning circuit and a detecting and rectifying circuit to secure an electric operating power from an electromagnetic wave of a predetermined power feeding frequency, a sensor to detect a parameter to be detected, and a sensor signal transmitter to transmit a signal outputted from the sensor as a wireless sensor signal in the form of an electromagnetic wave of a natural frequency different from the power feeding frequency; and~~

~~a sensor signal receiving unit to supply wirelessly the electric operating power to each of those wireless sensor units and to receive a sensor signal transmitted from each of those wireless sensor units, the sensor signal receiving unit including an electric power transmitter to transmit wirelessly the electromagnetic wave of the predetermined power feeding frequency and a sensor signal receiver to receive the wireless sensor signal of the natural frequency that is transmitted wirelessly from each of the wireless sensor units, wherein the sensor signal receiver of the sensor signal receiving unit includes:~~

~~a plurality of tuning circuits each operable to receive a signal of a single frequency corresponding to the assigned natural frequency of the wireless sensor signal transmitted from each of the wireless sensor units, and~~

~~a switching detector for switching among outputs of the tuning circuits to select the outputs one at a time on a time sharing basis and for detecting each of the selected outputs.~~

11. (Currently Amended) The wireless sensor system as claimed in claim 8A
~~wireless sensor system comprising:~~

~~a plurality of wireless sensor units, each of the wireless sensor units including an electric power receiver having a tuning circuit and a detecting and rectifying circuit to secure an electric~~

~~operating power from an electromagnetic wave of a predetermined power feeding frequency, a sensor to detect a parameter to be detected, and a sensor signal transmitter to transmit a signal outputted from the sensor as a wireless sensor signal in the form of an electromagnetic wave of a natural frequency different from the power feeding frequency; and~~

~~a sensor signal receiving unit to supply wirelessly the electric operating power to each of those wireless sensor units and to receive a sensor signal transmitted from each of those wireless sensor units, the sensor signal receiving unit including an electric power transmitter to transmit wirelessly the electromagnetic wave of the predetermined power feeding frequency and a sensor signal receiver to receive the wireless sensor signal of the natural frequency that is transmitted wirelessly from each of the wireless sensor units, wherein the sensor signal receiver of the sensor signal receiving unit is capable of varying a receiving frequency in correspondence with the natural frequencies of the wireless sensor signals being transmitted thereto and is capable of receiving the wireless sensor signals by switching among the receiving frequencies to select the receiving frequencies one at a time on a time sharing basis.~~

12. (Previously Presented) The wireless sensor system as claimed in claim 8, wherein the electromagnetic wave for power feeding has a plane of polarization that is different from that of the electromagnetic wave of the wireless sensor signal.

13. (Previously Presented) The wireless sensor system as claimed in claim 8, wherein the respective electromagnetic waves of the wireless sensor signals transmitted from the associated wireless sensor units have different planes of polarization.

14. (Previously Presented) The wireless sensor system as claimed in claim 8, wherein the plural wireless sensor units are mounted on different bearings in a machine plant.

15. (Previously Presented) The wireless sensor system as claimed in claim 8, wherein at least one of the plural wireless sensor units includes the sensor utilized as a tire pressure sensor for an automotive vehicle or a rotation sensor for a wheel support bearing assembly.

16. (Currently Amended) A bearing assembly equipped with a wireless sensor unit, comprising:

a plurality of wireless sensor units mounted on a bearing, each of the wireless sensor units including:

a sensor to detect a parameter to be detected;
a sensor signal transmitter to transmit wirelessly a sensor signal outputted from the sensor; and
an electric power receiver to receive wirelessly an electric operating power required to drive the sensor and the sensor signal transmitter,
wherein the plural wireless sensor units are operable to transmit to one common sensor signal receiver the respective sensor signals transmitted from the corresponding sensor signal transmitters, and
only one electric power transmitter is provided for commonly transmitting the electric operating power wirelessly to the plural electric power receivers.

17. (Currently Amended) A bearing assembly equipped with a wireless sensor unit, comprising:

one of a plurality of wireless sensor units that is mounted on a bearing,
wherein the plural wireless sensor units each include
a sensor to detect a parameter to be detected;
a sensor signal transmitter to transmit wirelessly a sensor signal outputted from the sensor; and
an electric power receiver to receive wirelessly an electric operating power required to drive the sensor and the sensor signal transmitter; and

wherein the plural wireless sensor units are operable to transmit to one common sensor signal receiver the respective sensor signals transmitted from the corresponding sensor signal transmitters and are also operable to receive wirelessly the electric operating power from a one common electric power transmitter through the respective electric power receiver.

18. (Currently Amended) A bearing assembly equipped with a wireless sensor, comprising:

a plurality of sensors to detect respective parameters to be detected;
a sensor signal transmitter to transmit wireless sensor signals outputted from the respective sensors; and
an electric power receiver to receive wirelessly an electric operating power required to drive the sensors and the sensor signal transmitter,

wherein the plural wireless sensor units are operable to transmit to one common sensor signal receiver the respective sensor signals transmitted from the corresponding sensor signal

transmitters, and

only one electric power transmitter is provided for commonly transmitting the electric operating power wirelessly to the plural electric power receivers.

19. (Previously Presented) The bearing assembly as claimed in claim 16, wherein at least one of the sensors mounted on the bearing is a rotation sensor including a multipolar magnet, having a plurality of magnetic poles deployed in a direction circumferentially thereof, and a magnetic sensor to detect the magnetic poles of the multipolar magnet.

20. (Previously Presented) The bearing assembly as claimed in claim 17, wherein at least one of the sensors mounted on the bearing is a rotation sensor including a multipolar magnet, having a plurality of magnetic poles deployed in a direction circumferentially thereof, and a magnetic sensor to detect the magnetic poles of the multipolar magnet.

21. (Previously Presented) The bearing assembly as claimed in claim 18, wherein at least one of the sensors mounted on the bearing is a rotation sensor including a multipolar magnet, having a plurality of magnetic poles deployed in a direction circumferentially thereof, and a magnetic sensor to detect the magnetic poles of the multipolar magnet.

22. (Previously Presented) The bearing assembly as claimed in claim 19, wherein the magnetic sensor is a magnetoresistive sensor.

23. (Previously Presented) The bearing assembly as claimed in claim 20, wherein the magnetic sensor is a magnetoresistive sensor.

24. (Previously Presented) The bearing assembly as claimed in claim 21, wherein the magnetic sensor is a magnetoresistive sensor.

25. (Previously Presented) The bearing assembly as claimed in claim 16, wherein the sensor is disposed within a sealed space in the bearing, which is shielded from the outside, and the electric power receiver and the sensor signal transmitter are disposed outside the bearing.

26. (Previously Presented) The bearing assembly as claimed in claim 17, wherein the sensor is disposed within a sealed space in the bearing, which is shielded from the outside, and

the electric power receiver and the sensor signal transmitter are disposed outside the bearing.

27. (Previously Presented) The bearing assembly as claimed in claim 18, wherein the sensor is disposed within a sealed space in the bearing, which is shielded from the outside, and the electric power receiver and the sensor signal transmitter are disposed outside the bearing.

28. (Currently Amended) A wheel support bearing assembly for rotatably supporting a vehicle wheel relative to a vehicle body structure, the wheel support bearing assembly comprising:

- an outer member having a plurality of outer raceways;
- an inner member having inner raceways aligned with the outer raceways;
- a plurality of rows of rolling elements interposed between the outer raceways and the inner raceways; and

- one of a plurality of wireless sensor units mounted on the wheel support bearing assembly,

- the plural wireless sensor units each including a sensor to detect a parameter to be detected, a sensor signal transmitter to transmit wirelessly a sensor signal outputted from the sensor and an electric power receiver to receive wirelessly an electric operating power required to drive the sensor and the sensor signal transmitter,

- the plural wireless sensor units are operable to transmit the respective sensor signals to one common sensor signal receiver through the corresponding sensor signal transmitters and also operable to receive wirelessly the electric operating power from aone common electric power transmitter through the electric power receiver.

29. (Currently Amended) A wheel support bearing assembly for rotatably supporting a vehicle wheel relative to a vehicle body structure, the wheel support bearing assembly comprising:

- an outer member having a plurality of outer raceways;
- an inner member having inner raceways aligned with the outer raceways;
- a plurality of rows of rolling elements interposed between the outer raceways and the inner raceways;

- a plurality of sensors to detect respective parameters to be detected;
- a sensor signal transmitter to transmit wireless sensor signals outputted from the respective sensors;

an electric power receiver to receive wireless an electric operating power required to drive the sensors and the sensor signal transmitter,

wherein the plural wireless sensor units are operable to transmit to one common sensor signal receiver the respective sensor signals transmitted from the corresponding sensor signal transmitters, and

only one electric power transmitter is provided for commonly transmitting the electric operating power wirelessly to the plural electric power receivers.

30. (Previously Presented) A wireless sensor system comprising:
a wheel support bearing assembly as defined in claim 28;
a sensor signal receiver for receiving the sensor signal transmitted from the sensor signal transmitter in the wheel support bearing assembly; and
an electric power transmitter for transmitting wireless the electric operating power to the electric power receiver;,
wherein the sensor signal receiver and the electric power transmitter are disposed in a tire house of the vehicle body structure, where the wheel support bearing assembly is installed, or disposed in a portion of the vehicle body structure, which is more distant from the tire house with respect to the wheel support bearing assembly.

31. (Previously Presented) A wireless sensor system comprising:
a wheel support bearing assembly as defined in claim 29;
a sensor signal receiver for receiving the sensor signal transmitted from the sensor signal transmitter in the wheel support bearing assembly; and
an electric power transmitter for transmitting wireless the electric operating power to the electric power receiver;,
wherein the sensor signal receiver and the electric power transmitter are disposed in a tire house of the vehicle body structure, where the wheel support bearing assembly is installed, or disposed in a portion of the vehicle body structure, which is more distant from the tire house with respect to the wheel support bearing assembly.